

No. 819,568.

PATENTED MAY 1, 1906.

R. MANTHEY.
WATCH.

APPLICATION FILED OCT. 26, 1903.

3 SHEETS—SHEET 1.

Fig. 1.

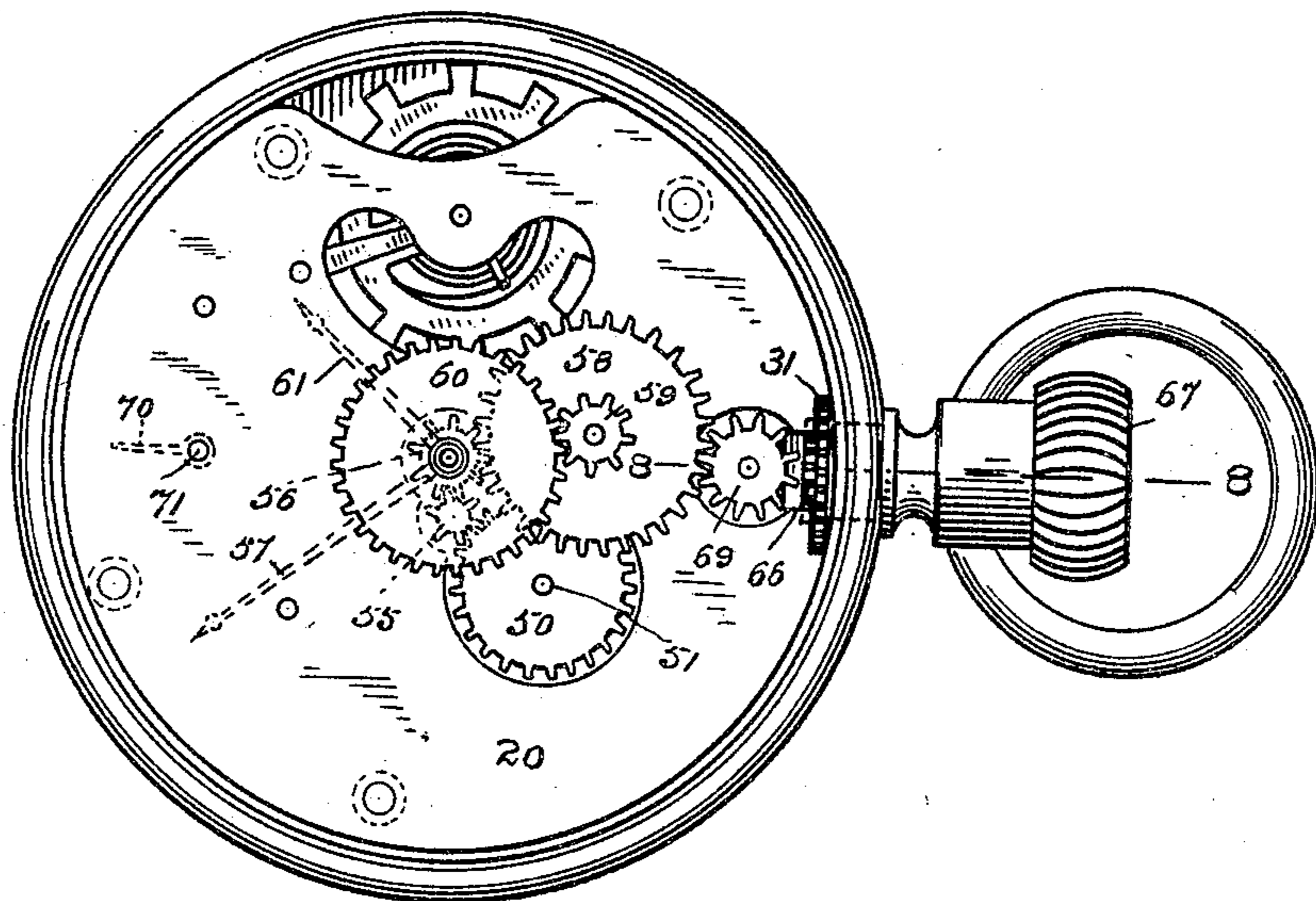
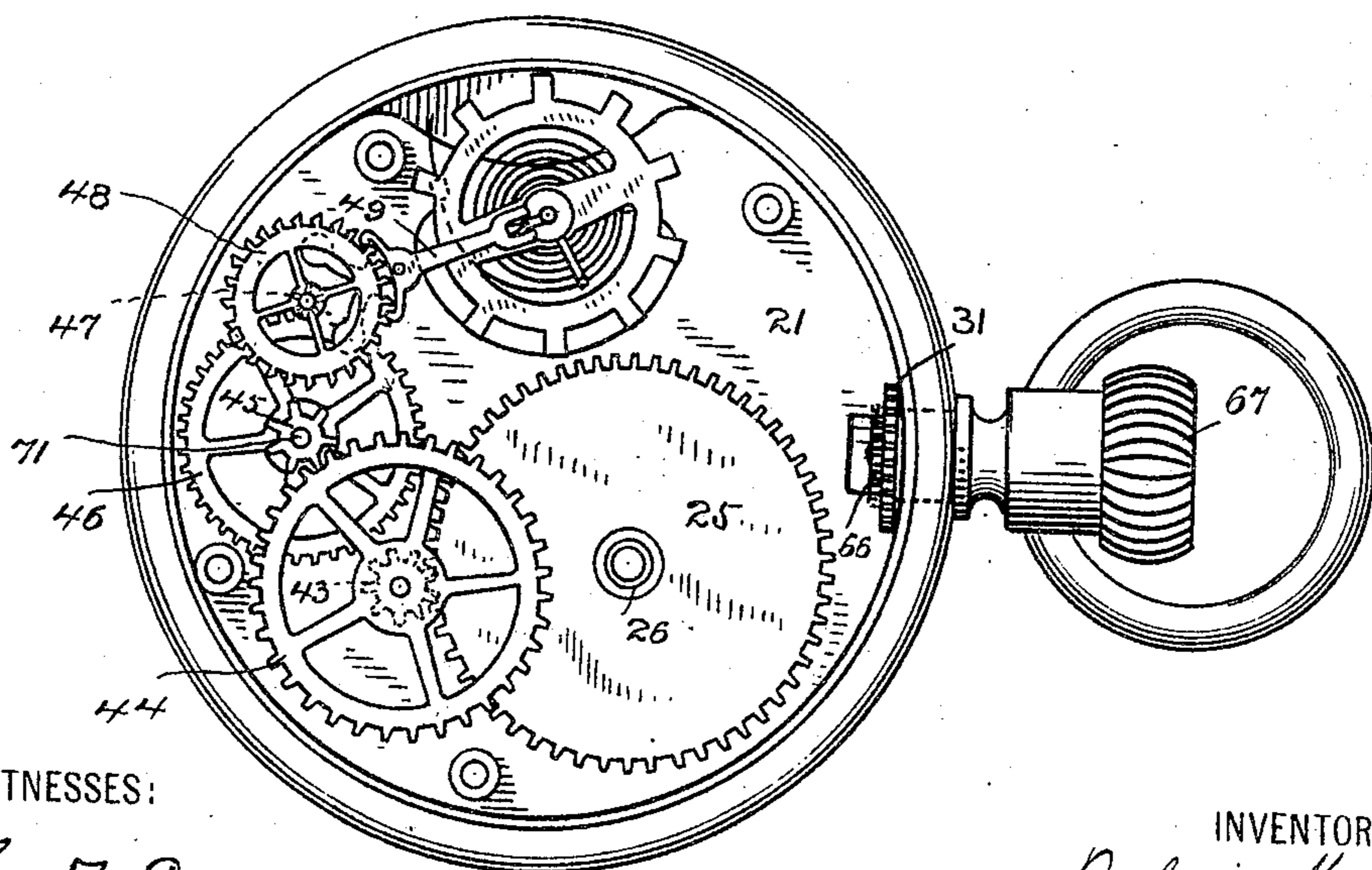


Fig. 2.



WITNESSES:

H. A. Lamb.
S. W. Atherton.

INVENTOR

Robert Manthey

BY

A. M. Wooster

ATTORNEY

No. 819,568.

PATENTED MAY 1, 1906.

R. MANTHEY.
WATCH.

APPLICATION FILED OCT. 26, 1903.

3 SHEETS—SHEET 2.

Fig. 3.

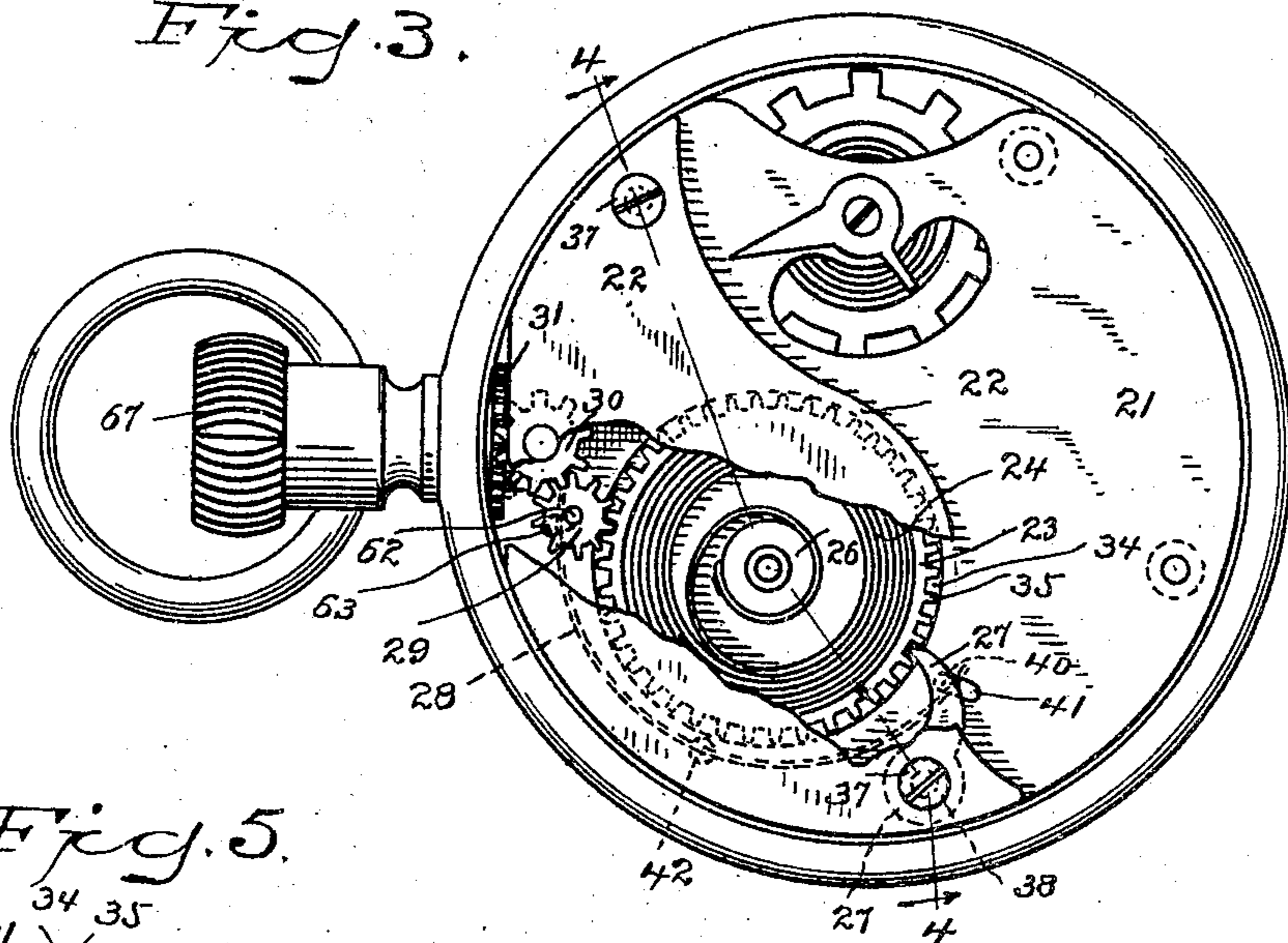


Fig. 5.

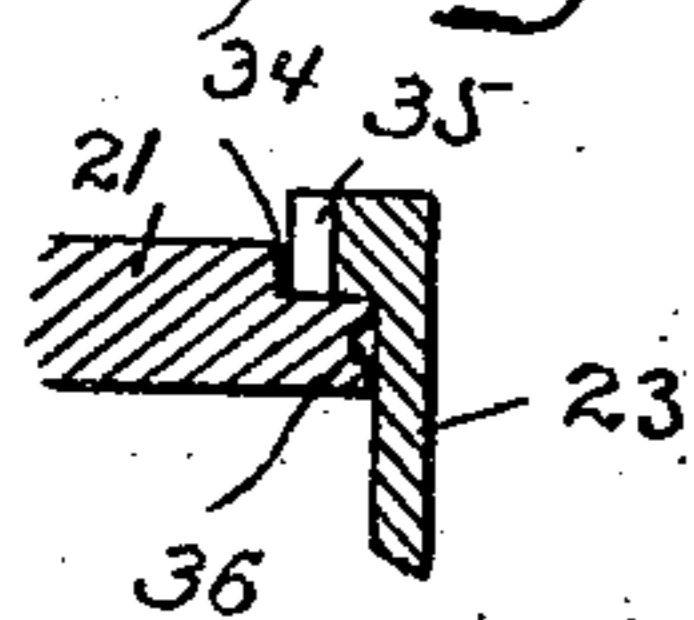


Fig. 4.

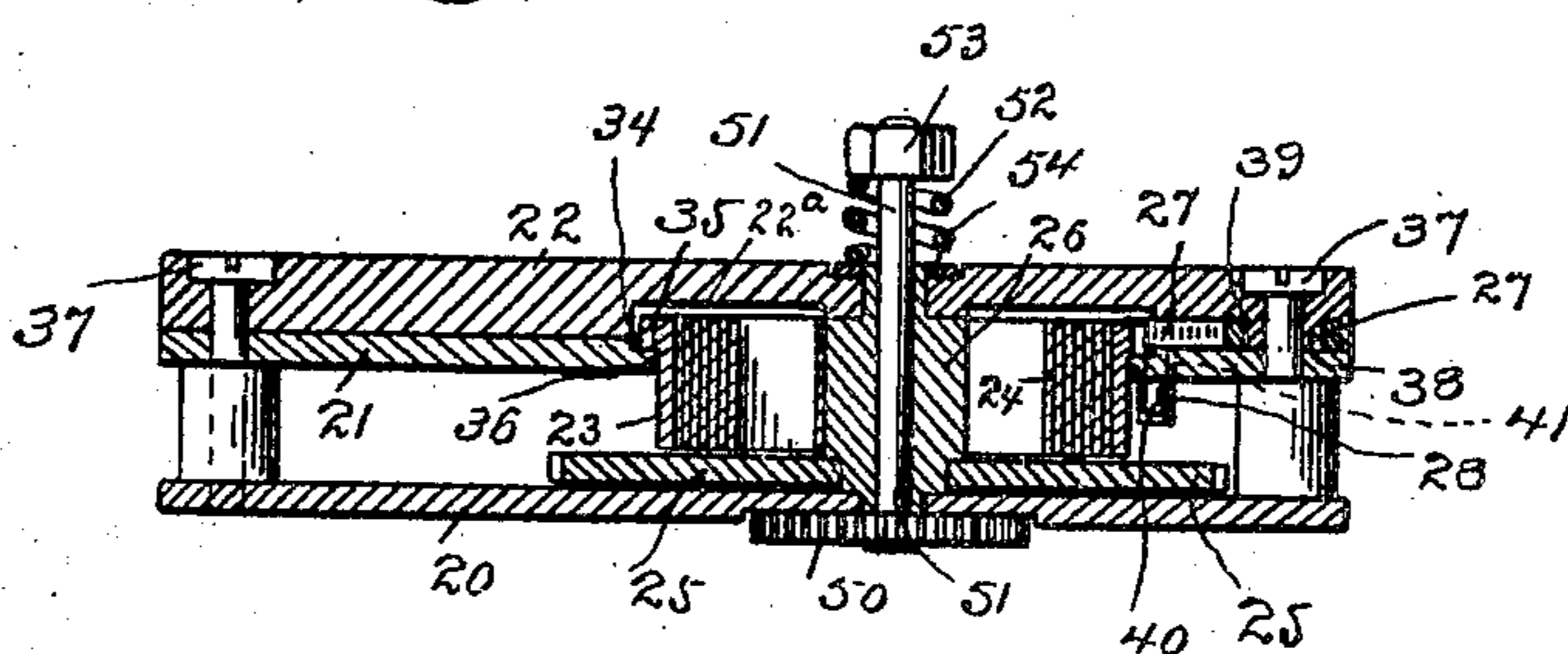
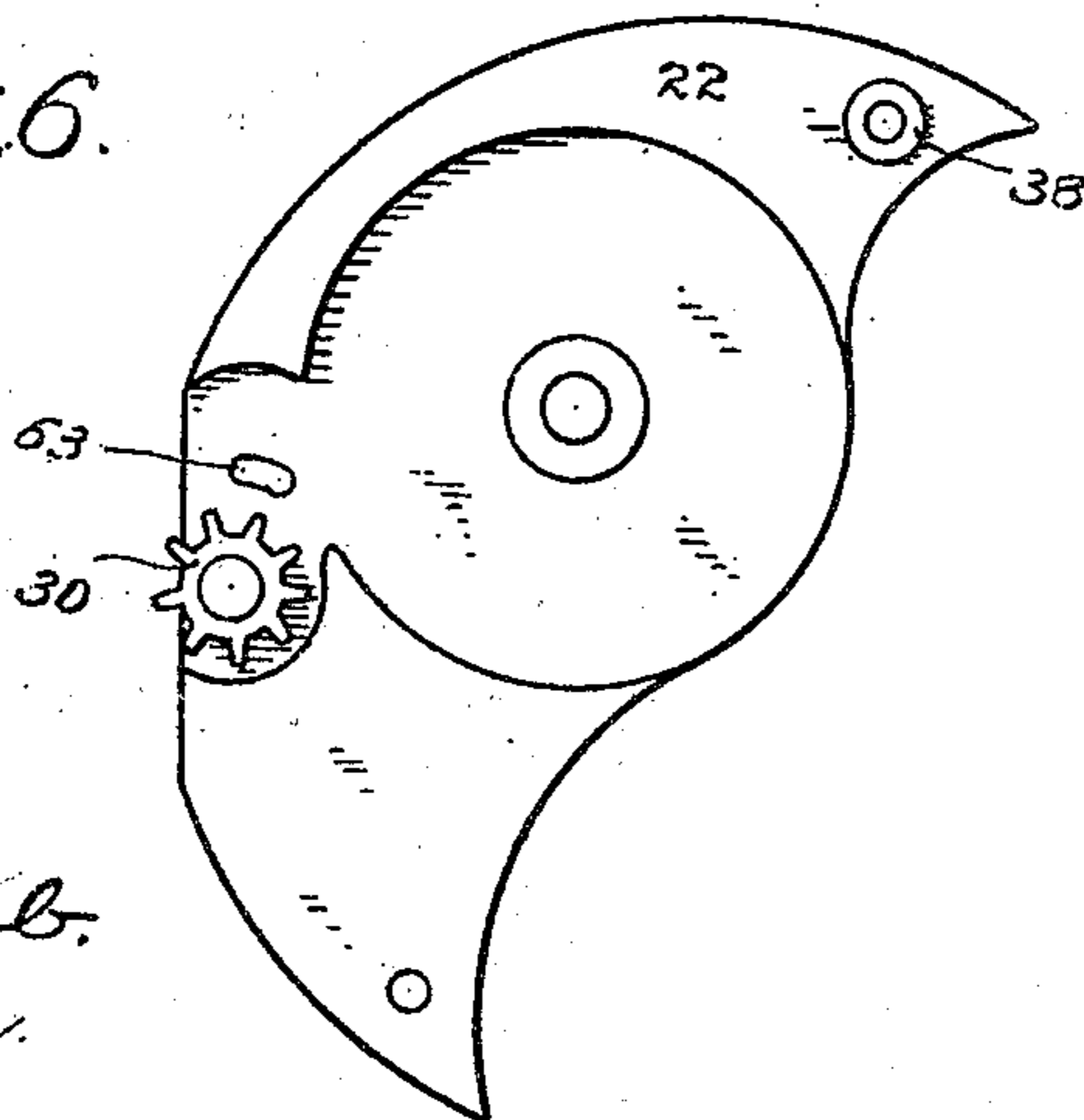


Fig. 6.



WITNESSES:

H. A. Lamb.
J. W. Atherton.

INVENTOR

Robert Manthey

BY

A. M. Wooster

ATTORNEY

No. 819,568.

PATENTED MAY 1, 1906.

R. MANTHEY.
WATCH.

APPLICATION FILED OCT. 26, 1903.

3 SHEETS—SHEET 3.

Fig. 7.

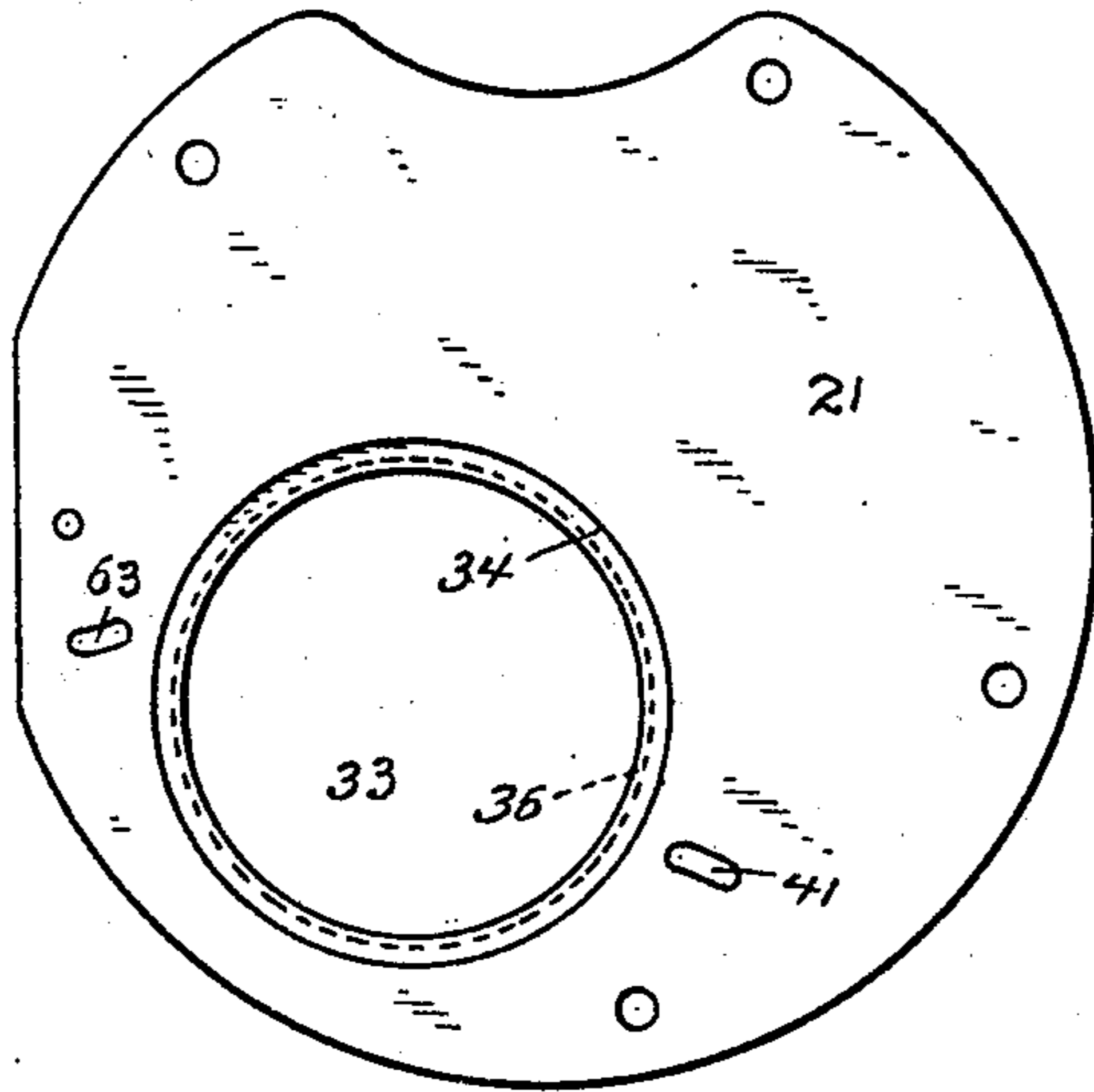


Fig. 8.

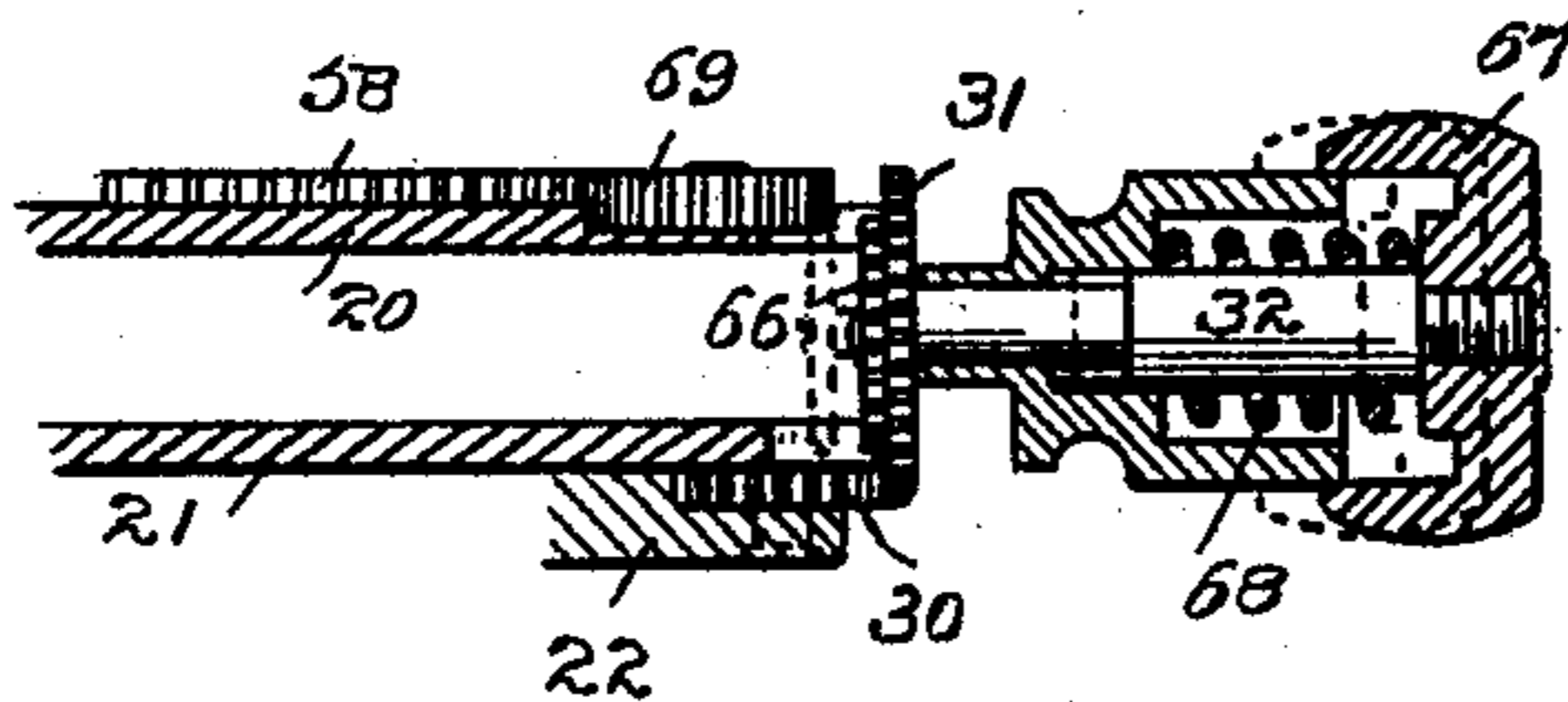


Fig. 10.

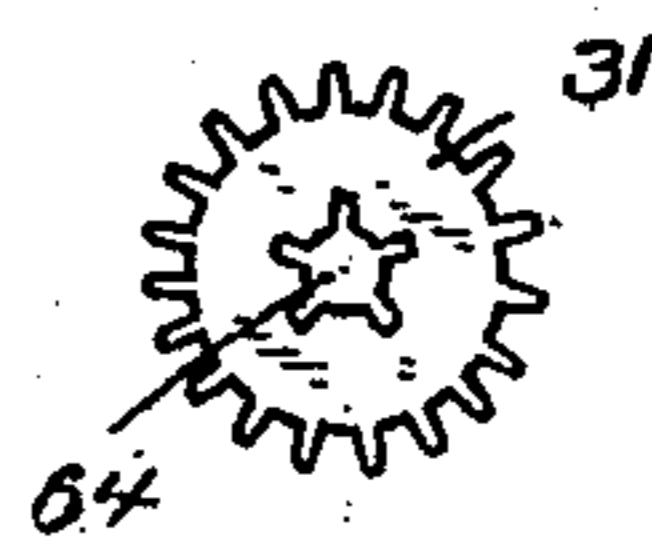


Fig. 9.

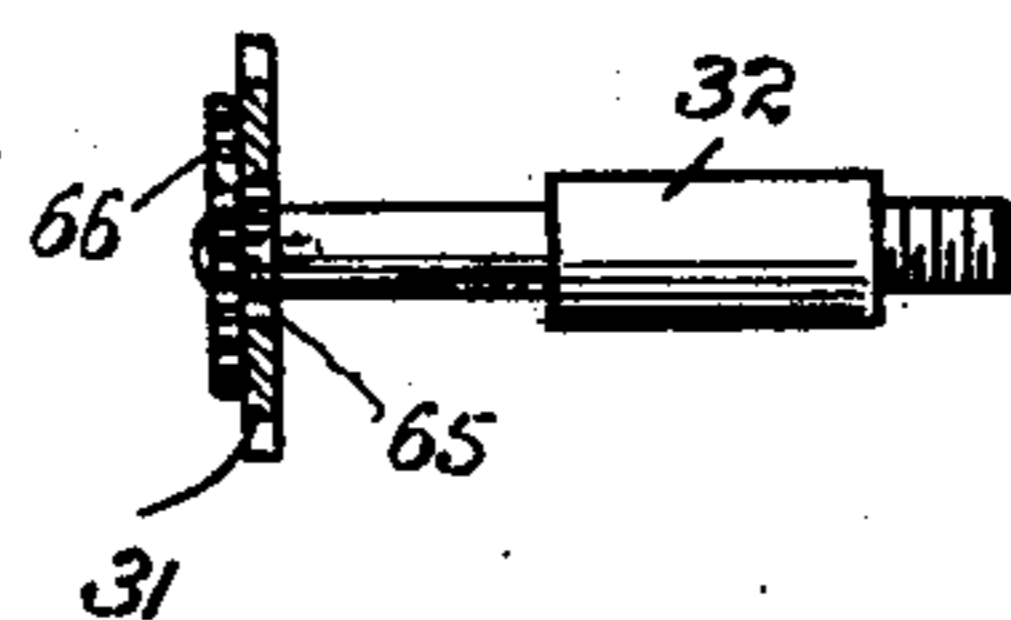
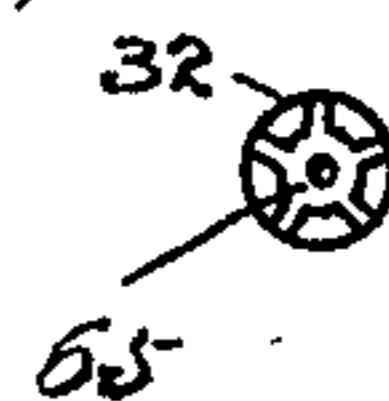


Fig. 11.



WITNESSES:

H. A. Lamb.
J. W. C. Heston.

INVENTOR

Robert Manthey

BY

A. W. Proctor

ATTORNEY

UNITED STATES PATENT OFFICE.

ROBERT MANTHEY, OF BRIDGEPORT, CONNECTICUT.

WATCH.

No. 819,568.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed October 26, 1903. Serial No. 178,482.

To all whom it may concern:

Be it known that I, ROBERT MANTHEY, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Watch, of which the following is a specification.

My invention relates more especially to the construction of "cheap" watches, so called, and has for its general objects to produce a watch that will keep relatively accurate time and in which the cost of construction shall be reduced by lessening the number of parts by simplification and as a result of the construction permitting high-grade labor to be dispensed with in adjusting the watches for shipment and use.

In watches as ordinarily constructed the train consists of five wheels and four pinions and the barrel which contains the mainspring is closed upon one side and is carried by a staff, the mainspring resting against the closing wall. The possible width of the mainspring is therefore reduced by the thickness of this wall. The winding-click, furthermore, is usually carried by the upper plate, and the construction is such, more especially in cheap watches, that the click tends to tilt the barrel and cause friction between the barrel and the main wheel. Furthermore, in cheap watches the construction and arrangement of the movable winding-wheel are such as to produce tilting in use, which prevents it from working smoothly and causes unnecessary wear.

It is one of the objects of the present invention to produce a watch in which the barrel instead of being closed on one side and provided with a staff shall be open on both sides—i. e., a ring—and without journal or staff, so that the mainspring may be fully as wide as the barrel. This construction permits the use of a lighter and more flexible spring than has heretofore been possible or when springs of ordinary thickness are used gives a maximum of power without increase of space required. The construction, furthermore, enables me to press the barrel out of sheet metal, thereby greatly reducing the cost of construction, and to support the barrel in the watch in such a manner as to render tilting wholly impossible.

A further object of the invention is to produce a watch in which the ordinary "center wheel," so called, and center-wheel pinion shall be dispensed with, the main wheel

meshing directly with the third-wheel pinion and revolving toward the left—that is, in the reverse direction from ordinary watches.

A further object of the invention is to produce a construction in which the bridge shall perform the several functions of retaining the barrel and mainspring in place and also of retaining the movable winding-wheel which reciprocates between the bridge and the top plate.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, which will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, forming part of this specification, Figure 1 is an elevation, on an enlarged scale, of my novel watch with the dial removed, showing the back plate, the pointers being indicated by dotted lines; Fig. 2, a similar view with the back plate removed; Fig. 3, a reverse elevation showing the top plate and the bridge partly broken away; Fig. 4, a section on the line 4 4 in Fig. 3, the train being removed; Fig. 5, an enlarged detail sectional view illustrating my novel mode of supporting the barrel; Fig. 6, an inverted plan view of the bridge detached; Fig. 7, a view of the top plate detached; Fig. 8, a section of the plates and winding and setting mechanism on the line 8 8 in Fig. 1; Fig. 9, a corresponding view of the stem and the stem winding and setting wheels detached, the former being in section; Fig. 10, an elevation of the stem-winding wheel detached; and Fig. 11 is an end view of the stem detached, showing the angular key which engages the stem-winding wheel.

20 denotes the back plate; 21, the top plate; 22, the bridge; 23, the barrel; 24, the mainspring; 25, the main wheel; 26, the main-wheel arbor; 27, the click; 28, a double-acting spring which controls both the click and the movable winding-wheel, (indicated by 29;) 30, the fixed winding-wheel; 31, the stem-winding wheel, and 32 the stem. The main-wheel arbor is journaled in the bridge and the back plate, and the main wheel is rigidly secured thereto, as clearly shown in Fig. 4. The respective ends of the mainspring are secured to the arbor and to the barrel in the ordinary or any preferred manner. The top plate is provided with an opening 33, surrounded by a countersink 34, adapted to receive oil. The

barrel is provided with a peripheral toothed flange 35, which rests in the countersink and supports the barrel and mainspring and is engaged by the movable winding-wheel in the usual manner. The essentially novel feature of the barrel is that it is simply a ring open from side to side and without the usual closing wall or a staff. The barrel and mainspring are supported wholly by the engagement of the flange on the barrel with the countersink in the top plate, whereby tilting is rendered impossible, and are retained in place by the bridge, the latter having a recess 22^a to receive the projecting portion of the toothed flange. By the provision of the countersink 34 and the recess 22^a a combined recess is formed within the bridge and top plate to receive the toothed flange, thereby permitting the bridge and top plate to closely fit each other adjacent to the teeth of the flange, reducing the liability of the entrance of dust thereto. Furthermore, the provision of the combined recess affords an additional means for preventing tilting in case the walls of the opening 33 become worn in use, the walls of the combined recess forming an abutment to prevent such tilting movement. This construction enables me to use a mainspring the full width of the barrel, thereby producing ample power with a lighter spring than it has heretofore been possible to use and to press the barrel out of sheet metal. It will be seen, therefore, that my present construction by reducing the number of wheels in the train lessens the work required of the spring and at the same time enables me to increase the power of the spring, thereby avoiding danger of stoppage and greatly reducing the time required in adjusting the watches for shipment and use.

36 denotes a circular oil-groove surrounding the opening 33 in the top plate. In use this groove and the countersink are filled with oil, thereby reducing friction in winding to the minimum. By providing both countersink and oil-groove as oil-receptacles the barrel is practically supported by an oil-bearing.

The bridge and the top and back plates are held together by screws 37. 38 denotes a hub which may or may not be made integral with the bridge and in the assembled position lies between the bridge and the top plate. The click is provided with an opening 39, which receives this hub, on which the click oscillates freely. The click is held in engagement with the teeth of the barrel by a suitable spring, in the present instance one end of spring 28, which bears against a pin 40, extending downward from the click and passing through a slot 41 in the top plate. Spring 28 is supported by a stud 42, which extends downward from the top plate. (See dotted lines, Fig. 3.) This construction prevents the possibility of the click tilting and insures

uniform pressure on the barrel under all conditions. Furthermore, the hub forms a spacing device between the bridge and top plate, thereby preventing the application of pressure on the face of the click.

The essential feature of novelty in the train lies in the fact that it comprises four wheels and three pinions instead of five wheels and four pinions, as in ordinary watch-trains, the wheel and pinion omitted being the ordinary "center wheel" and "center-wheel pinion," so called. The wheels which I term the "main," "third," "second," and "fifth" or scape wheels correspond with the wheels that bear those names in ordinary watch-trains. (See Fig. 2, in which the third-wheel pinion and fifth-wheel pinion appear in dotted lines only, it being of course understood that the corresponding wheels and pinions—as, for example, the third wheel and third-wheel pinion—are fixed to the same staff and move together in the usual manner.) The main wheel (indicated by 25) meshes with the third-wheel pinion, (indicated by 43,) the third wheel (indicated by 44) meshes with the second-wheel pinion, (indicated by 45,) the second wheel (indicated by 46) meshes with the fifth-wheel pinion, (indicated by 47,) and the fifth or scape wheel (indicated by 48) is controlled by a pallet or lever 49 in the usual manner. The seconds-hand, which I have indicated by 70, (see dotted lines, Fig. 1,) is carried by the second wheel, the staff to which the second wheel, second-wheel pinion, and seconds-hand are all affixed being for convenience indicated by 71.

50 denotes the minute-wheel, which is carried by a staff 51, adapted to reciprocate longitudinally in main-wheel arbor 26, if required. The minute-wheel in use, however, moves with the main-wheel arbor. It will be noted in Fig. 4 that the minute-wheel staff passes through and beyond the bridge. The minute-wheel is retained in frictional engagement with one end of the main-wheel arbor by means of a spring 52, one end of which is shown as bearing against a suitable head or nut 53 at the opposite end of the minute-wheel staff, the other end of the spring bearing against a washer 54, socketed in the outer face of the bridge. This frictional connection of the minute-wheel with the main-wheel arbor performs the same function that is performed in ordinary watches by friction applied to the center wheel, which in the present structure is dispensed with. The minute-wheel meshes with an intermediate pinion 55, which in turn meshes with the cannon-pinion 56, carrying the minute-hand 57. (See dotted lines, Fig. 1.) The cannon-pinion also meshes with a dial-wheel 58, carrying a pinion 59, which meshes with the hour-wheel 60, carrying the hour-hand 61.

In order to cause the hands to revolve in the right direction—that is, over from left to

right—the ordinary “center wheel” and “center-wheel pinion,” so called, of a watch-train being dispensed with, I connect the main-spring to the barrel and to the main-wheel arbor in such a manner as to cause the main wheel arbor carrying the main wheel to turn in the reverse direction from ordinary trains—that is, over from right to left instead of from left to right.

As seen in Fig. 2, main wheel 25 will turn from left to right, third-wheel pinion 43 and third wheel 44 will turn from right to left, and second-wheel pinion 45, second wheel 46, and the seconds-hand, all of which are affixed to staff 71, will turn from left to right. The cannon-pinion is caused to turn in the proper direction—that is, over from left to right—by the interposition of pinion 55 (see Fig. 1) between minute-wheel 50 and the cannon-pinion, which is indicated by 56 and carries the minute-hand, (indicated by 57.)

Movable winding-wheel 29 lies between the bridge and the top plate and is carried by a staff 62, which is adapted to oscillate in corresponding slots 63 in the top plate and bridge. (See Figs. 6 and 7 in connection with Fig. 3.) This wheel meshes with toothed flange 35 on the barrel and with fixed winding-wheel 30 and is yieldingly retained in operative position by a suitable spring, in the present instance one end of spring 28, which bears against staff 62. This construction, it will be noted, leaves the movable winding-wheel free to oscillate in its plane of rotation and to turn in either direction during the operation of winding, and, furthermore, prevents the possibility of said wheel tilting and avoids unnecessary and excessive wear upon the parts. Fixed winding-wheel 30 is engaged by stem-winding wheel 31, which is itself provided with a central angular opening 64, adapted to be engaged by a correspondingly-shaped head or key 65 on stem 32. In the present instance I have shown opening 64 and key 65 as five-pointed, which is a form I have found satisfactory in use on account of the slight rotation of the stem required to effect an engagement between the stem and the stem-winding wheel. 66 denotes the stem-setting wheel, which is rigidly secured to the stem just below key 65, so that when the key is in engagement with the stem-winding wheel, as in Fig. 9, the stem-setting wheel will lie in contact with the stem-winding wheel. In setting, the crown (indicated by 67) is pushed inward in the usual manner against the power of spring 68, which disengages key 65 from the stem-winding wheel and places stem-setting wheel 66 in engagement with setting-wheel 69, which itself meshes with dial-wheel 58. (See dotted lines, Fig. 6.)

Having thus described my invention, I claim—

1. In a watch free from center wheel and center-wheel pinion, the combination with a main-wheel arbor rotating from left to right, and a minute-wheel in frictional engagement therewith, said minute-wheel having its axis in alinement with the axis of the main-wheel arbor, of a cannon-pinion, a pinion intermediate the cannon-pinion and the minute-wheel, and a dial-wheel, dial-pinion, and hour-wheel.

2. In a watch, the combination with a bridge and back plate, and a main-wheel arbor journaled therein, of a minute-wheel, a staff by which it is carried, said staff extending axially of said arbor and adapted to be reciprocated longitudinally thereof, said staff being of greater length than said arbor, a nut 53, and a spring interposed between said nut and the bridge, said spring tending to retain said minute-wheel in frictional engagement with the end of the arbor.

3. In a watch, the combination with a main-wheel arbor and its actuating mechanism, of a minute-wheel frictionally carried by said arbor, means for controlling the movement of said arbor, a cannon-pinion carrying the minute-hand, and an intermediate pinion meshing with said minute-wheel and cannon-pinion.

4. In a watch, a barrel, a main-wheel arbor mounted axially thereof and carrying a main wheel, a spring connecting the barrel and main-wheel arbor, a minute-wheel frictionally carried by said arbor, escapement mechanism operatively connected with said main wheel, a cannon-pinion carrying the minute-hand, and an intermediate pinion meshing with the minute-wheel and cannon-pinion.

5. In a watch, the combination with a main-wheel arbor and its actuating mechanism, of a main wheel carried thereby, said arbor and its main wheel rotating from left to right, a third wheel and pinion, a second wheel and pinion, a fifth or scape wheel and pinion, a pallet, the third pinion engaging the main wheel, the second pinion engaging the third wheel, the fifth pinion engaging the second wheel, and the fifth or scape wheel engaging the pallet, a minute-wheel frictionally carried by said arbor, a cannon-pinion carrying the minute-hand, and an intermediate pinion meshing with said minute-wheel and cannon-pinion.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT MANTHEY.

Witnesses:

A. M. WOOSTER,
S. W. ATHERTON.